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WHAT IS CLAIMED:

1. A system for tracking multiple targets using distributed linear sensor arrays, comprising:
an plurality of arrays of sensors for receiving signals from a target;
10 a receiver for receiving signals received by the plurality of sensor arrays;
an analog/digital converter for converting the signals received from the sensor arrays to a
digital format, if signals are received in an analog format;
a digital storage device for storing the digitized data from the sensor arrays; and
a computer system for retrieving the stored digitized data from the plurality of sensor
15 arrays and processing the data through the use of a composite Hough transform to determine a
track of the target.

2. A system for tracking multiple targets using distributed linear sensor arrays, comprising:
one or more arrays of sensors for receiving signals from a target;
20 means for receiving signals received by the plurality of sensor arrays;
means for converting the signals received from the sensor arrays to a digital format, if
required;
means for storing the digitized data from the sensor arrays; and
a computer system for retrieving the stored digitized data from the sensor arrays and
25 processing the data through the use of a composite Hough transform to determine a track of the

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5 target.

3. A system, as in Claim 2, wherein the sensors for receiving signals from a target are acoustic sensors.

10 4. A system, as in Claim 2, wherein the sensors for receiving signals from a target are electromagnetic sensors.

5. A system, as in Claim 2, wherein the sensors for receiving signals from a target are optic sensors.

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6. A system, as in Claim 2, wherein the receiver is an acoustic receiver.

7. A system, as in Claim 2, wherein the receiver is an electromagnetic signal receiver.

20 8. A system, as in Claim 2, wherein the means for converting the signals received from the sensor arrays to a digital format, if required, is an analog-to-digital converter.

9. A system, as in Claim 2, wherein the means for storing the digitized data from the sensor arrays is a computer.

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- 5 10. A computer system for processing digitized data to determine the track of a target
comprising;
- a data storage device; and
- a computer for retrieving data from the data storage device and computing
- hypothesizing a reference track relative to a primary sensor array;
- 10 hypothesizing a reference track relative to a primary sensor array;
- calculating an associated delay curve in a primary correlogram for the primary
array;
- calculating an associated delay curve in a secondary correlogram for the secondary
array;
- 15 accumulating data for the reference track by simultaneously integrating a series of
pixel values along the appropriate delay curve in the primary and secondary correlograms;
- storing the accumulated pixel values in composite Hough space; and
- thresholding the accumulated pixel values to detect the track.
- 20 11. A computer system for processing digitized data to determine the track of a target
comprising;
- a data storage device; and
- a computer for retrieving data from the data storage device and
- hypothesizing a track with track parameters values (θ_1 , v , D , t_{01});
- 25 generating a corresponding template delay curve in a primary correlogram;

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- 5 performing integration along the template delay curve in the primary correlogram;
computing a delay curve parameter ($\theta_2, v/D, t_{02}$) for a secondary array based on
geometric constraints;
generating a corresponding template delay curve in a secondary correlogram based
on the delay curve parameter ($\theta_2, v/D, t_{02}$);
- 10 performing integration along the template delay curve in the secondary
correlogram;
computing a delay curve parameter ($\theta_{2m}, v/D_{2m}, t_{02m}$) for the secondary array based
on geometric constraints;
generating a corresponding template delay curve in the secondary correlogram;
- 15 combining the integrated values and storing it in the corresponding composite
Hough space; and
thresholding the accumulated pixel values to detect the track.